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09/557,990	04/25/2000	James D. Carducci	AM 3536	8762

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EXAMINER

GOUDREAU, GEORGE A

ART UNIT	PAPER NUMBER
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1763

8

DATE MAILED: 07/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09-557790

Applicant(s)

Carducci et al

Examiner

George Goudreau

Group Art Unit

1763

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

☒ Responsive to communication(s) filed on (4-00' to 3-02') (i.e. - papers #1-7)

☐ This action is FINAL.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

☒ Claim(s) 1-31 is/are pending in the application.

Of the above claim(s) 17-25 is/are withdrawn from consideration.

☒ Claim(s) 7-12 is/are allowed.

☒ Claim(s) 1-6, 13-16, 26-31 is/are rejected.

☐ Claim(s) is/are objected to.

☐ Claim(s) are subject to restriction or election requirement

## Application Papers

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some\* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

☐ Copies of the certified copies of the priority documents have been received

in this national stage application from the International Bureau (PCT Rule 17.2(a))

\*Certified copies not received: \_\_\_\_\_

## Attachment(s)

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☒ Notice of Reference(s) Cited, PTO-892

☐ Notice of Informal Patent Application, PTO-152

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Other \_\_\_\_\_

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15. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-16, drawn to an apparatus for plasma treatment, classified in class 156, subclass 345.1 (+).
- II. Claims 26-31, drawn to a method for plasma treatment, classified in class 216, subclass 63 (+).
- III. Claims 17-25, drawn to a magnet system, classified in class 183, subclass 25 (+).

Inventions III and I-II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the combination does not require the specific usage of a cylindrical magnet system. The subcombination has separate utility such as its usage in apparatus other than those in which a plasma is formed.

During a telephone conversation with attorney Robert Stern on 7-26-02' a provisional election was made without traverse to prosecute the invention of the plasma treatment method, and the plasma treatment apparatus, claims 1-16, and 26-31. Affirmation of this election must be made by applicant in replying to this Office action. Claims 17-25 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

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Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventor ship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventor ship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(I).

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

17. Claims 1-2, 4-6, 26-27, and 29-31 are rejected under 35 U.S.C. 102(e) as being anticipated by Loewenhardt et. al. (6,030,486).

Loewenhardt et. al. disclose a method, and an apparatus for rie etching a substrate in an apparatus equipped with means for confining the charged particles in a plasma formed in a plasma processing chamber (10) to the plasma processing chamber. The plasma confinement means is comprised of a cylindrical, permanent magnet system (82) which surround an exhaust channel (44) attached to the plasma processing chamber. A deflector is placed in the center of both the exhaust channel, and the magnet system. A gas inlet (22) is used to supplying processing gas to the processing chamber. This is discussed specifically in columns 3-5; and discussed in

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general in columns 1-12. This is shown specifically in figures 4 A- 4 B; and shown in general in figures 1-8.

18. Claims 13-15 are rejected under 35 U.S.C. 102(e) as being anticipated by

Collins et. al. (6,054,013).

Collins et. al. disclose a method, and an apparatus for rie etching a substrate in an apparatus equipped with means for confining the charged particles in a plasma formed in a plasma processing chamber (1035) to the plasma processing chamber. The plasma confinement means is comprised of a cylindrical, magnet system (2130, 2135) which surround an exhaust channel (1075) attached to the plasma processing chamber. A gas inlet (2210) is used to supplying processing gas to the processing chamber. There are no other magnetic systems used in the apparatus taught by Collins et. al. other than the one which is described above. This is discussed specifically in columns 28-42; and discussed in general in columns 1-44. This is shown specifically in figures 48-80; and shown in general in figures 1-80.

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

20. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to

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the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

21. Claims 3, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loewenhardt et. al. as applied in paragraph 17 above.

Loewenhardt et. al. as applied in paragraph 17 above fail to disclose the following aspects of applicant's claimed invention:

-the specific usage of magnetic, plasma confinement means in the apparatus taught above which produce a magnetic field with a strength less than 5 gauss at the surface of the wafer

It would have been obvious to one skilled in the art to employ magnetic plasma confinement means in the apparatus taught above which produce a magnetic field with a strength less than 5 gauss at the surface of the wafer to be plasma processed based upon the following. It would have been desirable to form the magnetic field which is used to confine the plasma to the plasma processing chamber such that a minimal amount of disturbance is caused at the surface of the wafer to be plasma etched on the cathode in order to prevent adverse effects on the anisotropy of the etch. The usage of a target value of less than 5 gauss for the magnetic field at the surface of the wafer to be rie etched simply represents the usage of an acceptable level of disturbance of

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the plasma by an extraneous magnetic field which is formed at the surface of the wafer to be rie etched.

22. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et. al. as applied in paragraph 18 above.

Collins et. al. as applied in paragraph 18 above fail to disclose the following aspects of applicant's claimed invention:

-the specific usage of magnetic, plasma confinement means in the apparatus taught above which produce a magnetic field with a strength less than 5 gauss at the surface of the wafer

It would have been obvious to one skilled in the art to employ magnetic plasma confinement means in the apparatus taught above which produce a magnetic field with a strength less than 5 gauss at the surface of the wafer to be plasma processed based upon the following. It would have been desirable to form the magnetic field which is used to confine the plasma to the plasma processing chamber such that a minimal amount of disturbance is caused at the surface of the wafer to be plasma etched on the cathode in order to prevent adverse effects on the anisotropy of the etch. The usage of a target value of less than 5 gauss for the magnetic field at the surface of the wafer to be rie etched simply represents the usage of an acceptable level of disturbance of the plasma by an extraneous magnetic field which is formed at the surface of the wafer to be rie etched.

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23. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321© may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

24. Claims 13-16 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-17, and 24-56 of U.S. Patent No. 6,030,486.

Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following.

This reference claims a method, and apparatus for plasma processing a substrate in which a magnetic field is used to confine a plasma on an exhaust channel from a plasma processing apparatus.

25. Claims 13-16 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of copending Application No. 09/775,173. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following.



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This reference claims a method, and apparatus for plasma processing a substrate in which a magnetic field is used to confine a plasma on an exhaust channel from a plasma processing apparatus.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

26. Claims 13-16 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-12 of copending Application No. 09/775,295. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following.

This reference claims a method, and apparatus for plasma processing a substrate in which a magnetic field is used to confine a plasma on an exhaust channel from a plasma processing apparatus.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

27. Claims 13-16 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-14 of U.S. Patent No. 6,402,885. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following.

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This reference claims a method, and apparatus for plasma processing a substrate in which a magnetic field is used to confine a plasma on an exhaust channel from a plasma processing apparatus.

28. Claims 13-16 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-17 of copending Application No. 09/521,799. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following

This reference claims a method, and apparatus for plasma processing a substrate in which a magnetic field is used to confine a plasma on an exhaust channel from a plasma processing apparatus.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

29. Claims 7-12 are allowed.

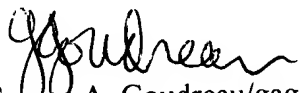
30. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

31. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner George A. Goudreau whose telephone number is (703) -308-1915. The examiner can normally be reached on Monday through Friday from 9:30 to 6:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Examiner Gregory Mills, can be reached on (703) -308-1633. The appropriate fax phone number for the organization where this application or proceeding is assigned is (703) -306-3186.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) -308-0661.



George A. Goudreau/gag

Primary Examiner

AU 1763